

Colonic Stent Use in Patients With Malignant Flexure Tumors Presenting With Obstruction

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ABSTRACT

Background and Objective: Colonic stenting in left-sided tumor is being commonly used. However, placing a stent in the flexure tumors is rare because it is technically more difficult. In this study, we aimed to retrospectively screen patients with flexure tumors admitted to our clinic who were treated using a colonic stent and discuss our findings.

Methods: Patients admitted to the emergency department for obstructive colonic tumors between 2012 and 2017 were retrospectively evaluated, and 21 patients treated using stents were included in the study. The expandable metal stent (Wallflex®, Boston Scientific, Marlborough, MA, USA) was placed at the obstruction through the lead wire.

Results: The mean age of the patients was 62 years, and the ratio of females to males was 3:18. Splenic flexure tumors were detected in 18 patients and hepatic flexure tumors in 3 patients. Seven of the patients were stented for palliative purposes. Fourteen of the cases underwent surgery. Three of them underwent laparoscopic surgery and eleven underwent open surgery.

Conclusions: Preoperative stenting in colonic flexura tumors is associated with faster healing, less postoperative complications, lower rates of colostomy, and higher rates of minimally invasive surgery, and can be safely used at experienced centers.

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INTRODUCTION

Colorectal cancer is the third most common cause of death due to cancer. Particularly, some of the left colon and rectum tumors refer to emergency services with obstruction findings. Studies on different series reported rates between 10% and 30%.^{1,2}

A consensus has not yet been reached on the timing of surgical treatment for patients with intestinal obstruction due to colon cancer. Currently, some centers prefer open stoma surgery with or without resection, whereas other centers prefer colonoscopic stenting for bridging before surgical treatment in order to reduce obstruction findings and to improve the patient's clinic. Because of intestinal obstruction, the majority of these patients are fatigued and dehydrated, and due to old age and comorbidities, the morbidity and mortality rates of surgeries performed in emergency situations are high. Morbidity rates of up to 40% and mortality rates of up to 15% have been reported in different studies.³

In these patients with obstructive colon tumors, who are referred to the emergency department, eliminating obstruction using a stent due to reasons such as inadequate preoperative preparation, impaired general condition of the patient, preoperative technical difficulties, and requirement of progressive surgery may result in decompression and palliation, allowing safe postponement of curative surgery and allowing the entire colon to be examined using colonoscopy.^{4,5}

This method (colonic stenting) is being commonly used. However, placing a stent in the right or left colon is relatively easy, but it is technically more difficult to place a stent in the flexure tumors.⁶⁻⁸ We were unable to find a randomized clinical trial focusing on this topic when conducting a literature search. Therefore, we aimed to retrospectively screen patients with flexure tumors admitted to our clinic who were treated using a colonic stent and discuss our findings.

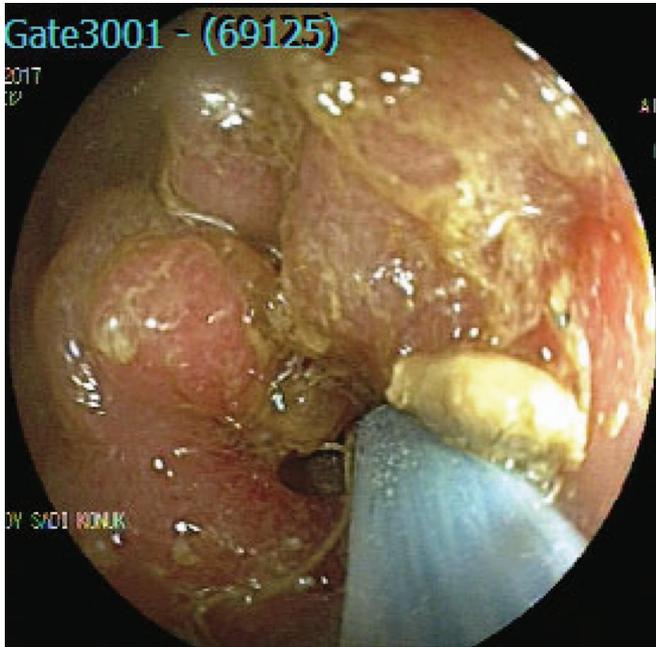


Figure 1. Image of the tumor before stent insertion.

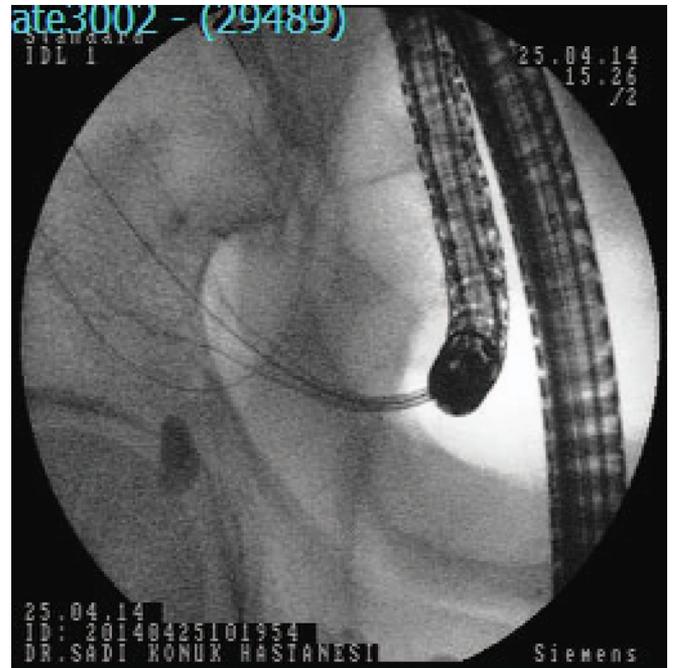


Figure 2. Deployment of the wire to the proximal end of the tumor under scopy.

MATERIALS AND METHODS

Patients admitted to the emergency department of our hospital for obstructive colonic tumors between 2012 and 2017 were retrospectively evaluated, and 21 patients treated using stents in the splenic and hepatic flexures were included in the study. Patients were clinically (ileus) and radiologically (contrast-enhanced computed tomography, direct abdominal X-ray) diagnosed and staged. The location and approximate size of the tumor were determined using computed tomography. Cases suspected of having perforation and those with tumors localized outside both flexures were excluded in the study. All stent applications were performed by experienced general surgery specialists at our clinic. Bowel preparation was performed rectally on patients who were determined to be suitable for stent placement. A biopsy was performed for pathologic diagnosis from the patients under sedentary anesthesia using colonoscopy after the lesion area was reached, and then a guide wire (slippery lead wire) with a thickness of 0.0035 inches was passed through the obstruction zone (**Figure 1**). It was observed under scopy that the wire was proximal to the tumor and the cannula was advanced through the guide wire to the distal side of the tumor and was proven to be in the lumen by passing contrast material (**Figure 2**). The expandable metal stent (Wallflex®, Boston Scientific,

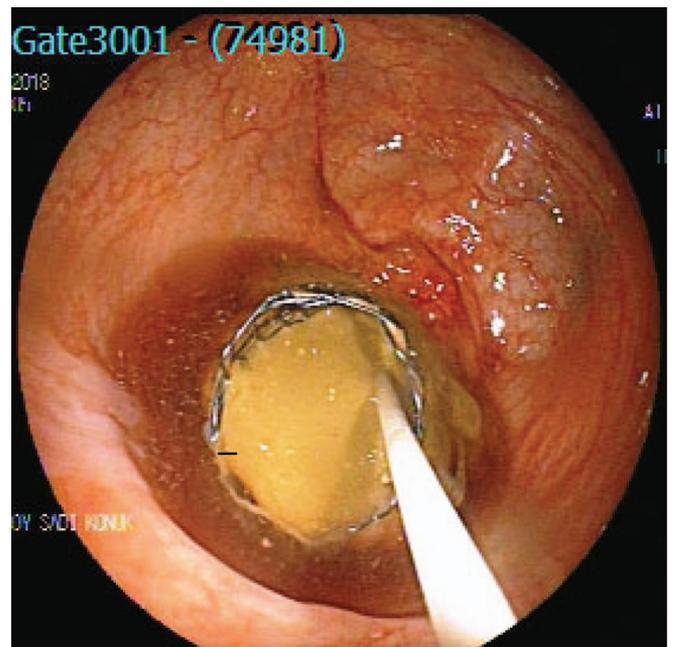


Figure 3. Image after the expandable metal stent is attached.

Marlborough, MA, USA) was placed at the obstruction through the lead wire (**Figure 3**). Under scopy, a stent was opened so that the lower and upper ends of the stent exceeded the proximal and distal ends of the

tumor by at least 3 cm. Stent placement was assessed by colonoscopy, and its suitability was determined. All patients underwent a direct abdominal X-ray to investigate the possibility of perforation, and all patients were followed for 24–48 hours to check for possible complications and stent patency. Full colon cleansing was performed with phospho-soda in patients who were preoperatively stented for bridging, who underwent surgery after 8–14 days, and in whom oncologic operations appropriate to the localization of the tumor were performed. Patients with palliative stents were discharged after their general conditions improved.

RESULTS

The mean age of the patients was 62 (range, 32–86) years, and the ratio of females to males was 3:18. Splenic flexure tumors were detected in 18 patients and hepatic flexure tumors in 3 patients. Seven of the patients were stented for palliative purposes. These patients were not operated and were continued on oncologic therapy. Oral feeding was initiated the next day after colonic stenting for patients who were stented for palliative purposes and with no complications, and these patients were discharged after 24–48 hours. Two of the patients with palliative stent were lost to follow up after 5–6 months. Other patients were followed up for 1–3 years. None of these patients had intestinal function-related or stent-related problems.

Fourteen of the cases underwent surgery. Three of them underwent laparoscopic surgery and eleven underwent open surgery. Expanded right hemicolectomy was performed in 2 patients with hepatic flexure tumors. Due to the presence of multiple adenomatous polyps in the preoperative colonoscopy of another patient, subtotal colectomy and ileorectal anastomosis plus ileostomy were performed. In 2 of 11 patients with splenic flexure tumors, stents did not work effectively; hence, emergency surgery was performed within approximately 48 hours. Resection + stomal opening were performed on these 2 patients. Seven patients underwent expanded left hemicolectomy. Two patients with adenomatous polyps in the sigmoid colon detected during preoperative colonoscopy were also anteriorly resected (**Table 1**).

DISCUSSION

Malignant diseases are the most common causes of large intestinal obstruction in patients admitted to emergency departments requiring surgery. Mechanical large intestinal

obstruction accounts for approximately 30% of all colon cancers. In colon tumors presented with obstruction, phased operations are usually performed that require opening of the stoma.^{9,10}

In these patients with intestinal obstruction referred to emergency departments, intestinal cleansing is usually not performed. Furthermore, their intestinal diameters are different at the distal and proximal ends of the obstruction. Since gastrointestinal dilatation and distension at the proximal end of the obstruction, which often prove to be difficult to operate, also cause ischemia at the colon wall, proximal ans may be of insufficient quality for stoma opening or anastomosis. Therefore, a two-stage surgery is usually required for these patients.

In these cases, colostomy is usually performed with primary tumor resection. In our study, 12 patients who underwent stent placement and subsequent curative surgical procedures were treated with resection and anastomosis, and no colostomy was needed. Decompression with stent could not be performed in 2 patients. In these two patients, the stent was placed in the tumor area but the stent was not opened. We think this is due to the difficulty in flexural localization and the length of the tumor segment. These patients underwent resection + stomal opening. The negative effects of colostomy on quality of life and problems associated with closure should not be overlooked. Transient colostomy is never closed in some high-risk patients.

Since preoperative colonoscopy and metastasis screening are not performed on patients undergoing emergency surgery, a possible synchronous or metachronous tumor diagnosis is not possible. Colonoscopy was performed in 21 patients included in the study, and 7 patients were found to be inoperable based on computed tomography findings and these patients were treated with palliation using stent alone.

Resection and anastomosis are the preferred standard methods in obstructive lesions of the right colon. Although there is no standard approach for treating obstructive lesions of the left colon, and debate on the surgical treatment options continue. The approach, especially in rectosigmoid cancers, has begun to change due to technological advancements, increasing endoscopic experience and successful introduction of minimally invasive procedures. Studies have been reported on successful stent application for palliation or bridging, particularly in the left colon and rectosigmoid-junction tumors. The use of stents has increased worldwide, and multistage opera-

Table 1.
Patient Data

Patient	Gender	Location	Purpose of Procedure	Operation	Discharge	Followup	Complications
1	Female	Splenic flexure	Palliation		5 days	Oncology	None
2	Male	Splenic flexure	Palliation		6 days	Oncology	None
3	Male	Splenic flexure	Palliation	—	36 hours	Lost	Unknown
4	Male	Splenic flexure	Palliation	—	24 hours	Lost	Unknown
5	Male	Splenic flexure	Palliation	—	24 hours	Oncology	None
6	Male	Splenic flexure	Palliation	—	36 hours	Oncology	None
7	Female	Splenic flexure	Palliation	—	36 hours	Oncology	None
8	Male	Splenic flexure	Laparoscopy	AR	6 days	—	None
9	Male	Splenic flexure	Laparoscopy	AR	5 days	PO Oncology	None
10	Male	Splenic flexure	Laparoscopy	ELH	5 days	PO Oncology	Surgical field infection
11	Male	Splenic flexure	Open surgery	ELH	6 days	—	None
12	Male	Splenic flexure	Open surgery	ELH	7 days	PO Oncology	None
13	Male	Splenic flexure	Open surgery	ELH	5 days	PO Oncology	None
14	Male	Splenic flexure	Open surgery	ELH	6 days	—	None
15	Male	Splenic flexure	Open surgery	ELH	5 days	—	None
16	Male	Splenic flexure	Open surgery	ELH	9 days	PO Oncology	Anastomosis leakage
17	Male	Splenic flexure	Open surgery	R + SO	5 days	PO Oncology	Intra-abdominal hematoma
18	Male	Splenic flexure	Open surgery	R + SO	6 days	PO Oncology	None
19	Male	Hepatic flexure	Open surgery	ERH	7 days	PO Oncology	None
20	Female	Hepatic flexure	Open surgery	ERH-	6 days	PO Oncology	Surgical field infection
21	Male	Hepatic flexure	Open surgery	SC&IRA+ I	7 days	PO Oncology	None

AR, Anterior resection; ELH, expanded left hemicolectomy; ERH, expanded right hemicolectomy; PO, postoperative oncology; R + SO, resection + stomal opening; SC&IRA+ I, subtotal colectomy and ileorectal anastomosis + ileostomy.

tions have begun to be replaced by single-stage, minimally invasive operations.¹¹⁻¹³

However, although stent application in colon tumors is becoming increasingly widespread, it is known that stent application is not common in tumors localized to the flexura. The most important reasons for this are that it is technically more difficult to place the stent in the flexura and the stent to be placed in the flexura is considered to be ineffective due to anatomical reasons. However, we think that the technical difficulties can be overcome because of the improvements in endoscopic instruments and devices and by the use of self-expandable stents. Since we have an advanced endoscopy unit and considerable experience in this area, we are striving to place a stent in all mechanical large intestine

obstruction cases admitted to our emergency department and perform a single-stage operation. When we conducted a retrospective study, we found that stents holding both flexures were applied to 21 cases in total and the procedures we performed were successful, except in 2 cases. In these 2 cases, an emergency operation was performed considering that the stent was ineffective. Stenting of obstructive colon tumors provides repassage and increases the chance of minimally invasive surgery. However, although this passage has been restored, many cases present to the emergency department when complete obstruction symptoms develop, and unfortunately at this stage, the diameter of the colon increases, mucosal ischemia develops and intra-abdominal fluid accumulation occurs. Further-

more, the proximal of the obstruction cannot be evaluated clearly by colonoscopy and laparoscopy. For these reasons, palpation of the proximal colon can be helpful in determining the extent of surgical resection. In this group of patients, laparoscopic resections are difficult in emergency conditions, but in recent years there has been an increase in this area with experience in our clinic. Laparoscopic colon surgery was performed in 3 of 12 patients in whom a stent was successful.

Placing a stent in the flexor region is more difficult than other localizations, and complications such as perforation are more likely to develop. Furthermore, the stent is less likely to open and provide passage in this region. We use stretchable acrobat guide wires in this region. These flexible wires make it easier to switch from flexure. Therefore the experience for stenting these regions is also important and sufficient time should be taken for the placement of these stents and the procedure should be done carefully. Our endoscopy unit is a well-experienced tertiary center.

Based on our findings, we found that success rates for stent applications in flexura tumors can go as high as 95%. However, when we conducted a literature review, we were unable to find any randomized, prospective, or retrospective study with a large-scale case series. Single case series or series consisting of several cases have been reported in the literature. In a case series consisting of 36 cases, Costa Santos et al¹⁴ reported that stenting was successfully performed in 2 cases with splenic flexura tumors. Similarly, stent application in cases with splenic flexura tumors was reported by Alcántara et al¹⁵ in 6 patients, Arezzo et al¹⁶ in 18 patients, Ho et al¹⁷ in 4 patients, and Pirlet et al¹⁸ in 3 patients.

In this retrospective study, we demonstrated our experience in stent bridging in obstructive flexura tumors, for which there is not enough data in the literature regarding the approach to these tumors. There is a need for more extensive and well-designed randomized prospective studies in this field.

CONCLUSION

Preoperative stenting in colonic flexura tumors is associated with faster healing, fewer postoperative complications, lower rates of colostomy, and higher rates of minimally invasive or less invasive surgery, and we believe that it can be safely used at experienced centers.

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